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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/910,952	07/24/2001	Duck Chul Hwang	1567.1015/MDS/JGM	3638
49455	7590	03/29/2005	EXAMINER	
STEIN, MCEWEN & BUI, LLP 1400 EYE STREET, NW SUITE 300 WASHINGTON, DC 20005			WEINER, LAURA S	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/910,952	Applicant(s) HWANG ET AL.	
	Examiner Laura S Weiner	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-42 is/are pending in the application.
- 4a) Of the above claim(s) 5-7 and 18-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4, 8-17, 29-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 1-18-05 have been fully considered but they are not persuasive. The claims remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The reasons are discussed below.

### ***Election/Restrictions***

2. Claims 5-7, 18-28 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 12-8-03.

### ***Claim Rejections - 35 USC § 112***

3. Claims 2-3; 4, 8-9, 29-30; 10, 31-35; 11; 12-13; 14-17, 36-40, 41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claims 2, 4, 10-12, there is no support for defining the viscosity with units of cP (centipoises). It is agreed that this is one of the common ways to label viscosity but it is not the only way. Viscosity can be described by using units of poise, centipoises, Pa, etc.

In claims 4, 11, 33 and 37, there is no support in the specification for the phrase "between 20% inclusively and 30% by volume of the electrolyte". There is no support for claiming 30% by volume as a range point. There is support for 20-80 % by volume or 20-40% by volume.

In claims 12, 32 and 36, there is no support in the specification for the phrase "the second solvent is between 70% and 80% inclusively by volume of the electrolyte". There is no support for claiming 70% by volume as a range point. There is support for 20-80% by volume or 60-80% by volume.

In claim 41, there is no support for a lithium-sulfur battery comprising a positive electrode comprising a lithium active material and a negative electrode comprising a sulfur active material. On page 6, [0030], of the specification, it teaches that the positive electrode contains the sulfur compound and on page 6, [0029], it teaches that the negative electrode comprises a carbon material.

#### ***Claim Rejections - 35 USC § 103***

4. Claims 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fauteux (5,172,057) in view of Yamamoto et al. (JP 7-335254, translation).

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Fauteux teaches in column 3, lines 20-60, an electrolytic cell comprising an anode comprising lithium and a positive electrode comprising a positive electrode active material constructed of a polysulfide. Fauteux teaches in column 5, lines 1-14, that the electrolyte is a liquid electrolyte comprising propylene carbonate and that a series of oxidation and reduction cycles enable the polysulfide/graphite compound to reversibly attract lithium ions.

Fauteux discloses the claimed invention except for specifically teaching that the lithium-sulfur battery comprises ethylene carbonate or propylene carbonate roughly between 20% and about 40% by volume of the electrolyte and a second solvent such as dimethyl carbonate, diethyl carbonate, etc. roughly between 80%-60% by volume of the electrolyte.

Yamamoto et al. teaches on page 1, [0003-0004] and page 2, [0008], of the translation, a battery comprising a negative electrode comprising a carbon material and an electrolyte that improves the capacitance characteristics of the cell and offers the lithium secondary battery excellent in the capacitance characteristics in high current discharge and low-temperature discharge without spoiling the effectiveness of the charge and discharge in a room temperature, discharge capacitance characteristics and volume energy density *[thus teaching the electrolyte prevents decomposition caused by graphite]*. Yamamoto et al. teaches on page 2, [0009], of the translation that electrolyte comprises ethylene carbonate, dimethyl carbonate and diethyl carbonate and teaches in [0010], that the nonaqueous electrolyte comprises between 0 and equal to 25 vol% of ethylene carbonate, 45-100 vol% of dimethyl carbonate and diethyl carbonate.

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Yamamoto et al. teaches on page 5, Table 1, an electrolyte comprising EC:DMC :DEC (20 :60 :20) or (40:40 :20), etc.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the electrolyte taught by Yamamoto et al. comprising EC:DMC :DEC in vol% of (20 :60 :20) or (40:40 :20) in the lithium-sulfur battery taught by Fauteux because Yamamoto et al. teaches the battery is excellent in the capacitance characteristics in high current discharge and low-temperature discharge without spoiling the effectiveness of the charge and discharge in a room temperature, discharge capacitance characteristics and volume energy density and would help to prevent decomposition caused by graphite.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

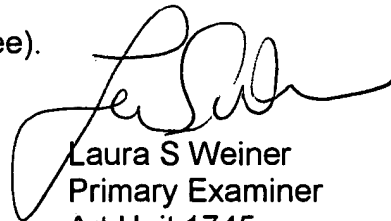
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura S Weiner whose telephone number is 571-272-1294. The examiner can normally be reached on M-F (6:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Laura S Weiner  
Primary Examiner  
Art Unit 1745

March 23, 2005